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EXAMINER	
BEHNCKE, CHRISTINE M	

ART UNIT	PAPER NUMBER
3661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	**Application No.** 10/582,970	**Applicant(s)** SHIMO ET AL.	
	Examiner CHRISTINE M. BEHNCKE	**Art Unit** 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 March 2010.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-7 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the Amendment and Remarks filed 3/29/2010, in which claims 1-7 were presented for examination.

Response to Arguments

Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto, JP 08-119197A (paragraphs cited below refer to the machine generated English translation), in view of Hedstrom, US, 4,069,784.

(Claim 1) Morimoto describes an automatic steering control apparatus which is carried in a ship having a positioning device for measuring a position of the ship (gyrocompass 20), and outputs a command rudder angle based on a deviation of a heading of the ship from a reference course ([0009]), comprising: an input device for inputting a desired turning center position ([0018]); storing the turning center position input by the input device, inherently requires a memory ([0018]); and a rudder angle output device for outputting a command rudder angle so that a track of the ship draws an arc around a turning center stored in the memory with a turning radius ([0012]), the turning radius being a distance from the position of the ship measured by the ship's positioning device to the turning center ([0010]). Morimoto does not specifically describe

using a bearing sensor to determine the rudder angle based on a deviation angle. However, Hedstrom teaches controlling a rudder steering system by controlling a rudder angle (controlling the yaw of the vehicle by rudder deflection), which is determined based on a deviation angle measured by measuring sensors on board the ship to determine the direction of the ship (column 13, lines 38-45, column 2, line 58-column 3, line 3). It was well known in the art at the time of the invention, as admitted in background of the invention of the present application, to use a bearing sensor to measure the motion/bearing of the ship, to determine a deviation from the target course, and determine a rudder angle (specification: page 1, line 24-page 2, line 1). It would have been obvious to one of ordinary skill in the vehicle control art to substitute the admitted conventional means of determining angle deviation and direction measurement with the means described by Morimoto because the combination would yield predictable results of prior art means of determining course error according to their established functions.

(Claim 2) Morimoto describes an autopilot which is carried in a ship having a positioning device for measuring a position of the ship (gyrocompass 20), and outputs a command rudder angle based on a deviation of a heading of the ship from a reference course ([0019]-[0020]), comprising: an input device for inputting a desired turning center position ([0018]); storing the turning center position input by the input device, inherently requires a memory ([0018]); and a rudder angle adjuster for adjusting a rudder angle so that a track of the ship draws an arc around a turning center position stored in a memory with a turning radius ([0012]), the turning radius being a distance from the

position of the ship measured by the ship's positioning device to the turning center ([0010]). Morimoto does not specifically describe using a bearing sensor to determine the rudder angle based on a deviation angle. However, Hedstrom teaches controlling a rudder steering system by controlling a rudder angle (controlling the yaw of the vehicle by rudder deflection), which is determined based on a deviation angle measured by measuring sensors on board the ship to determine the direction of the ship (column 13, lines 38-45, column 2, line 58-column 3, line 3). It was well known in the art at the time of the invention, as admitted in background of the invention of the present application, to use a bearing sensor to measure the motion/bearing of the ship, to determine a deviation from the target course, and determine a rudder angle (specification: page 1, line 24-page 2, line 1). It would have been obvious to one of ordinary skill in the vehicle control art to substitute the admitted conventional means of determining angle deviation and direction measurement with the means described by Morimoto because the combination would yield predictable results of prior art means of determining course error according to their established functions.

(Claim 3) Morimoto describes an automatic steering control apparatus which is carried in a ship having a positioning device for measuring a position of the ship (gyroscope 20), and outputs a rudder angle based on a deviation of a heading of the ship from a reference course ([0009]), comprising: an input device for inputting a desired turning radius and a desired turning center position ([0010], [0018]); a memory for storing the turning radius and the turning center position input by the input device ([0018], presetting radius and position inherently requires a memory); a rudder angle

output for outputting a command rudder angle so that a distance from a position of the ship measured by the ship's positioning device to a turning center stored in the memory, approaches the turning radius stored in the memory ([0019]-[0020], [0012]); wherein the rudder angle output device outputs a command rudder angle ([0012]).

Morimoto does not describe specifically drawing an arc from the time the ship distance to center equals the radius. However, Hedstrom teaches a vessel control apparatus including an input device for inputting a center location and/or radius (Column 19, lines 19-40 and line 57-column 20, line 6 and column 9, line 61-column 10, line 10), a memory for storing the data values (column 9, line 61-column 10, line 10), and a rudder angle output for outputting a rudder angle (column 8, lines 45-51) and so as to adjust a rudder angle so that a track of the ship draws an arc around the turning center with the turning radius from the time when the distance from the position of the ship to the turning center becomes substantially equal to the turning radius (figure 2, column 6, lines 8-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Morimoto with the teachings of Hedstrom because as Hedstrom suggests, including a straight lead distance and determining the rudder angle, turning radius at earliest points of time that equals the radius creates a smooth transition into a yaw movement (column 5, line 60-column 6, line 7).

Further, Morimoto does not specifically describe using a bearing sensor to determine the rudder angle based on a deviation angle. However, Hedstrom teaches controlling a rudder steering system by controlling a rudder angle (controlling the yaw of the vehicle by rudder deflection), which is determined based on a deviation angle

measured by measuring sensors on board the ship to determine the direction of the ship (column 13, lines 38-45, column 2, line 58-column 3, line 3). It was well known in the art at the time of the invention, as admitted in background of the invention of the present application, to use a bearing sensor to measure the motion/bearing of the ship, to determine a deviation from the target course, and determine a rudder angle (specification: page 1, line 24-page 2, line 1). It would have been obvious to one of ordinary skill in the vehicle control art to substitute the admitted conventional means of determining angle deviation and direction measurement with the means described by Morimoto because the combination would yield predictable results of prior art means of determining course error according to their established functions.

(Claim 4) Morimoto describes an autopilot which is carried in a ship having a positioning device for measuring a position of a ship (gyroscope 20), and outputs a command rudder angle based on a deviation of a heading of the ship from a reference course ([0009]), comprising: an input device for inputting a desired turning radius and a desired turning center position ([0010], [0018]); a memory for storing the turning radius and the turning center position input by the input device ([0018], presetting radius and position inherently requires a memory); and a rudder angle adjuster to the ship draws a circle, distance from the center equal to the radius selected ([0010]).

Morimoto does not describe specifically drawing an arc from the time the ship distance to center equals the radius. However, Hedstrom teaches a vessel control apparatus including an input device for inputting a center location and/or radius (Column 19, lines 19-40 and line 57-column 20, line 6 and column 9, line 61-column 10, line 10),

a memory for storing the data values (column 9, line 61-column 10, line 10), and a rudder angle adjuster for adjusting a rudder angle so that a distance from the position of the ship measured by a ship's positioning device to a turning center stored in a memory, approaches the turning radius stored in the memory (column 9, lines 25-30), wherein the rudder angle adjuster adjusts a rudder angle so that a track of the ship draws an arc around the turning center with the turning radius from the time when the distance from the position of the ship to the turning center becomes substantially equal to the turning radius (figure 2, column 6, lines 8-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Morimoto with the teachings of Hedstrom because as Hedstrom suggests, including a straight lead distance and determining the rudder angle, turning radius at earliest points of time that equals the radius creates a smooth transition into a yaw movement (column 5, line 60-column 6, line 7).

Further, Morimoto does not specifically describe using a bearing sensor to determine the rudder angle based on a deviation angle. However, Hedstrom teaches controlling a rudder steering system by controlling a rudder angle (controlling the yaw of the vehicle by rudder deflection), which is determined based on a deviation angle measured by measuring sensors on board the ship to determine the direction of the ship (column 13, lines 38-45, column 2, line 58-column 3, line 3). It was well known in the art at the time of the invention, as admitted in background of the invention of the present application, to use a bearing sensor to measure the motion/bearing of the ship, to determine a deviation from the target course, and determine a rudder angle

(specification: page 1, line 24-page 2, line 1). It would have been obvious to one of ordinary skill in the vehicle control art to substitute the admitted conventional means of determining angle deviation and direction measurement with the means described by Morimoto because the combination would yield predictable results of prior art means of determining course error according to their established functions.

(Claim 5) Hedstrom further teaches wherein the input device can input a desired turning direction, the memory stores the turning direction input by the input device, and the rudder angle adjuster adjusts a rudder angle so that the ship turns in the turning direction stored in the memory (column 20, line 62-column 21, line 24).

(Claim 6) Morimoto further describes the apparatus comprises an interrupt controller for independently changing the turning direction, the turning radius and the turning center position stored in the memory ([0011]).

(Claim 7) Morimoto describes an autopilot which is carried in a ship having a positioning device for measuring a position of a ship (gyroscope 20), and outputs a command rudder angle based on a deviation of a heading of the ship from a reference course ([0009]), comprising: an input device for inputting a desired turning radius and a desired turning center position ([0010], [0018]); a memory for storing the turning radius and the turning center position input by the input device ([0018], presetting radius and position inherently requires a memory); and a rudder angle adjuster to the ship draws a circle, distance from the center equal to the radius selected ([0010]).

Morimoto does not specifically describe inputting a direction, storing the direction, and an adjuster for obtaining a straight line connecting the position of the ship and a

turning center. However, Hedstrom teaches a vessel control apparatus including an input device for inputting a center location and/or radius and direction (Column 19, lines 19-40 and line 57-column 20, line 6 and column 9, line 61-column 10, line 10, column 20, line 62-column 21, line 24), a memory for storing the data values (column 9, line 61-column 10, line 10), and a rudder angle adjuster for obtaining a straight line connecting the position of the ship measured by the ship's positioning device and a turning center stored in the memory for storing the turning center position (figure 2, column 21, lines 13-24), obtaining an intersection of the straight line and a turning circle drawn around the turning center stored in the memory with the turning radius stored in the memory (column 10, lines 11-28), obtaining a tangent to the turning circle at the intersection (point 18' column 10, lines 1-10), calculating a distance difference between the position of the ship and the intersection (column 10, lines 45-57), and adjusting a rudder angle so that a course direction of the ship approaches the turning direction of the tangent stored in the memory (column 10, lines 45-57, column 6, lines 8-17). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Morimoto with the teachings of Hedstrom because as Hedstrom suggests, including a straight lead distance and determining the rudder angle, turning radius at earliest points of time that equals the radius creates a smooth transition into a yaw movement (column 5, line 60-column 6, line 7).

Further, Morimoto does not specifically describe using a bearing sensor to determine the rudder angle based on a deviation angle. However, Hedstrom teaches controlling a rudder steering system by controlling a rudder angle (controlling the yaw of

the vehicle by rudder deflection), which is determined based on a deviation angle measured by measuring sensors on board the ship to determine the direction of the ship (column 13, lines 38-45, column 2, line 58-column 3, line 3). It was well known in the art at the time of the invention, as admitted in background of the invention of the present application, to use a bearing sensor to measure the motion/bearing of the ship, to determine a deviation from the target course, and determine a rudder angle (specification: page 1, line 24-page 2, line 1). It would have been obvious to one of ordinary skill in the vehicle control art to substitute the admitted conventional means of determining angle deviation and direction measurement with the means described by Morimoto because the combination would yield predictable results of prior art means of determining course error according to their established functions.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE M. BEHNCKE whose telephone number is (571)272-8103. The examiner can normally be reached on 8:30 am- 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CMB

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661